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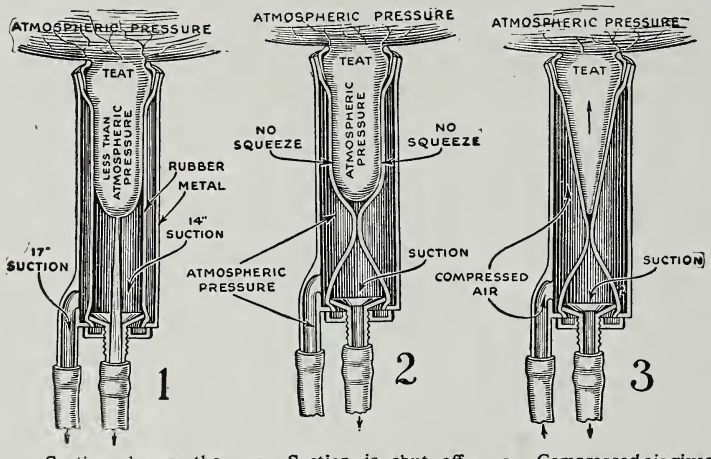

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Leaving Memories Behind—

We Enter Into Our Task

THE AGRICULTURAL STUDENT

Vol. XXIV. OHIO STATE UNIVERSITY, COLUMBUS, JUNE, 1918 *No. 10*

IMPORTANCE OF CHOOSING HERD SIRES

Points To Be Considered in the Selection, Care and Handling of Purebred Dairy Bulls

L. A. SUTERMEISTER, '18

THE sire is half the herd and sometimes we are inclined to think he is almost all of the herd. The quality of a dairy herd depends upon the bull. Offspring will show the earmarks of the sire and if he is a good one they will be excellent, if a poor one, poor sons and daughters will be the result.

Most cows are bred with no idea but to get a calf and with no thot of what kind of a calf will be secured. If a scrub bull is not kept on the place, the cow is bred to the closest one in the neighborhood. I know of one case where a farmer was milking 10 grade cows of mixed Shorthorn and Holstein blood. He secured a fine registered Holstein cow at a low price and bred this cow to his scrub bull in the same indifferent manner when there was an excellent bull about 15 miles away. When asked about the matter he said it took too much time and trouble to take the cow that far.

This is the trouble with too many of our farmers and one reason why they are losing money on their milk. Their herds are "running out." The first, best and cheapest place to improve is in the sire. According to Professor C. H. Eckles of the University of Missouri, "Every animal raised in the herd gets half its inheritance from the sire. For example, one bull might be the sire of 20 daughters in one herd in a year. If the dams be capable of averaging 200 pounds of fat each, and the sire represents a 350 pound strain, it is evident that the daughters should show an increase of 75 pounds. It is not uncommon to find even greater differences."

Blood or breeding is what counts because there will be uniformity in size, shape, color and breed characteristics. With a bull of no breeding behind him, one has no assurance of this uniformity, as he is liable to get variations in these factors and efficiency.

Selection of a Herd Sire.

According to Professor Eckles the selection of a dairy bull is generally made upon one of four points. (1) Breed, (2) Type or looks, (3) Pedigree, (4) Character of offspring. I would say that all four points ought to be taken into consideration with special emphasis on the third and fourth.

First of all, select a bull with a pedigree of high producing ancestry. One then knows the breeding of the bull and that his blood is pure. You are backed not only by the owner but also by the breed association and its members.

Do not choose a name or buy the bull because you can get the registration papers with him. One should look into the pedigree thoroly and consider the production records of his dam,

grand dams and great grand dams. His sisters might be taken into consideration but the most important point is to see that the dam has a high record. A yearly record is many times better than a 7 day or 30 day record. Production is wanted and the bull must have it bred into him thru the past generations so that he will be able to transmit this quality to his offspring. Breeding is merely speculating and the more high records the sire has behind him the more chances he has of getting high-producing offspring.

The dam, besides being a high producer, should conform closely to the breed qualities. Especially should she have size and vigor as a bull from an undersized dam will lack the size and vigor so essential to masculinity. The dam should have a large uniform udder with well placed teats and should not milk hard. Large tortuous veins are indicative of high production.

Health, vigor, size and masculinity are wanted along with breeding. The sire must have those qualities that indicate a good constitution and supremacy. Some of those qualities are: an alert eye, active appearance and sleek velvety coat of hair. Masculinity is shown by his appearance of absolute supremacy. This is brought out by his masculine head, broad muzzle, large neck and crest, deep heart girth, straight wide back, wide deep ribs and a well hung scrotum. He should not be lazy or sleepy but be easily controlled and of good temperament. Some breeders formerly based considerable influence upon the size and placement of the rudimentary teats but this is a point upon which there is much difference of opinion.

After carefully selecting a bull of the show ring type with all points making up an ideal form, we have no assurance what this bull will produce in the way of high producing daughters. Thus the real value of a bull is not determined until some of his daughters have been tested. This should impress the point that sires should be thoroly tried out before they are sent to the butcher or sold for a small sum. Too many good sires have gone this route in the past, not having been given time to show what they were worth.

Value of a Pure Bred Sire.

The value of a sire lies in the improvement of the daughters over the dam. This will vary with the grade of dam but improvements as high as 100 pounds of butterfat in the daughter have been found altho there may be a loss sometimes. Thus, one will readily see that with scrub cows almost any purebred bull will give an improvement but when the quality of the herd increases, the problem of selecting a proper sire becomes more complex. Because scrub cows are kept is not sufficient reason for getting any kind of a purebred bull. The better the bull the greater will be the improvement in the daughters.

Suppose the daughters of a certain bull give 50 pounds more of butterfat than do the dams and butterfat is 40 cents per pound. This would be an increased value of $20.00 upon the product. Suppose 15 heifers are raised a year which would make $300.00 for one year's service. A bull is normally good for at least 5 years which would make 5 times 300 or $1500.00. These figures are conservative as the increase might be greater depending upon size of herd and length of service. In addition his daughters will milk on an average 8 to 10 years and this increase will be transmitted to a certain degree in the next offspring and become a family trait.

Choosing a Breed.

If mixed grade cows are owned now, get a purebred bull of some high producing family of the breed you like. Select the breed that flourishes in your own part of the country and the one which is adapted to your care. All the breeds have high producing individuals and families. Do not get started in one breed and then change to another because your neighbor has been successful in that breed. After the breed is chosen, do not cross breed. Keep to one breed and an excellent family in that breed.

According to Professor J. M. Hover, "the superiority of one parent or breed in determining the characteristics of its offspring is termed prepotency." The fact that marked prepotency occurs in only a few animals in every breed, makes it an important consideration in animal breeding. Nearly all of the so-called families in the various breeds owe their origin to a male or female ancestor which was strongly prepotent in characters recognizable and useful.

Care of the Bull.

The bull ought to receive as good feed as the cows but not necessarily in the same proportion.

Many pure bred bulls are needed at the present time. Most of the dairy products come from the average herd, and here is where there is the best chance for improvement. If a purebred cow is bought in place of a bull, the offspring will have lower standards as there will be no good sire for breeding purposes on hand. In a few years the descendants of this cow will be back with the average of the herd.

In conclusion, select a pedigree bull from a well known family with a record behind him. Keep him until you have tested his daughters to determine his worth. Pay as much for a sire as you possibly can as the investment will soon pay. Get rid of all scrub bulls and have a definite object in breeding. Keep accurate records and properly care for the entire herd, not forgetting the sire which is half of the herd.

Group of High Producing University Cows

ORGANIC MATTER IN THE SOIL

How Fertilizers Will Increase This Soil Constituent

FIRMAN E. BEAR, Department of Agricultural Chemistry and Soils

WE may differ in our opinions as to the specific functions of organic matter in the soil. The experimental evidence on this point will bear several interpretations but we can agree that organic matter is a valuable constituent of soils and plays an important part in making them productive. There is so much evidence on this point that it seems unnecessary to discuss it further.

On the assumption, therefore, that we are agreed that organic matter is a highly important constituent of soils, the question for practical consideration is, how to increase the quantity of this material in the soil.

It will be observed that we use the word "increase" and not "maintain." There has been too much discussion concerning "maintaining" the fertility constituents in soils. What we need to discuss is how to **increase** the productivity of soils. Yields which were satisfactory 25 years ago cannot be so today. We need to think in terms of 100 bushel corn crops, 50 bushel wheat crops, and 4 ton clover crops. The thought of producing these and higher yields is stimulating. We wish to point out, therefore, that we need to "increase" the organic matter content of our soils since we need to increase the productivity of these soils.

It is the purpose of this article to discuss the means of increasing the organic matter in soils and the relation of the various fertility factors to this increase. Manure enthusiasts point to manure as being a most necessary material on the farm because it supplies organic matter. One of the chief objections offered against the use of fertilizers is that they contain little or no organic matter and that their use leaves the soil poorer in this constituent than before.

When statements such as these become current they are passed on from individual to individual without stopping to consider just what the evidence in the case may be. Manure is such a valuable product that it seems unnecessary to make any claims concerning it which are not borne out by the evidence. The old objections to fertilizers have been largely discredited by intelligent use. We will examine the merits of manure and fertilizers as sources of organic matter in soils.

For several years the writer was employed in research work at the West Virginia Agricultural Experiment Station. During that time he became interested in the chemical examination of the various fertility plots on the experiment station farm. These fertility plots differed from those at most experiment stations in that the elements of fertility had been applied in large amounts and any effects which they might ordinarily have were accordingly magnified. The amount of manure applied to plot 25, for example, averaged 12 tons per acre per year for the entire 16 year period. Plot 26 received acid phosphate and nitrate of soda each at the rate of 300 pounds and sulfate of potash at the rate of 100 pounds per acre yearly.

In order to study the changes produced by the use of these liberal applications of the various materials, a carefully chosen composite sample of soil was selected from each plot and subjected

to chemical analysis. Many interesting facts were observed from these analyses not the least of which was that relating to the content of organic matter in these soils.

It will be sufficient for the purpose of this article to discuss the content of organic matter contained in the soil of three plots, viz.: plots 25, 26 and 27. These plots had been under experiment for 16 years with the fertilizer treatments noted above, plot 27 being a check and receiving no fertilizer or manure. A variety of crops were grown on plots during this period consisting of: rye 2 crops, wheat 2 crops, clover 3 crops, corn 3 crops, cowpeas 1 crop, potatoes 1 crop. This amounts practically to a rotation of a cultivated crop, a small grain crop, a legume crop and a hay crop. This would correspond to a corn, wheat, clover and timothy rotation.

A comparison between the yield of crops and the content of organic matter in the soil of these plots is shown in the following table:

Relation Between Crop Yields and Organic Matter.

Plot	Treatment	Pounds Produce 16 Year Total	Pounds Organic Matter Per Acre to Plow Depth
25	Manure	139,670	63,400
26	Fertilizer	117,910	52,600
27	Check	42,170	37,900

The manure enthhusiasts may say "I told you so. Look at the amount of organic matter in the manured soil." But it seems logical to study the most striking point first and this is that the fertilizer, which contained no organic matter, left the soil with an increase of practically 50 per cent of this material over the unfertilized plot.

This is a most significant fact. Rightly interpreted it means that organic matter in soils can be increased by the use of any material which will increase the yield of crops, whether that material be fertilizer, manure, limestone or anything else. It also means that such operations as drainage, the use of proper rotations, the growing of legumes, in so far as they increase the productivity of soils, will also increase the content of organic matter in these soils.

Evidently organic matter in soils is secured in large part thru the roots and stubble left behind after the crops are removed. Large crops have large root systems and a thick matting of stubble or sod. Poor crops have small root systems. The difference between the check plot and the fertilizer plot lies in the amount of material left behind in the soil after the crop has been removed.

Returning to the effect of manure, we note that its use caused an increase over the check plot of 25,000 pounds of organic matter in 16 years, as compared to an increase of 14,700 pounds with the fertilizer. But 190 tons of manure containing 95,000 pounds of organic matter were applied to secure this 25,500 pounds while the fertilizer brought about its increase and yet contained in itself no organic matter. It will be observed that increasing the yield from 42,170 pounds to 117,910 of total produce by the use of fertilizer was responsible for increasing the organic matter from 37,900 to 52,600 pounds. In other words, an increase of 5 pounds in yield resulted in an increase of 1 pound of organic matter.

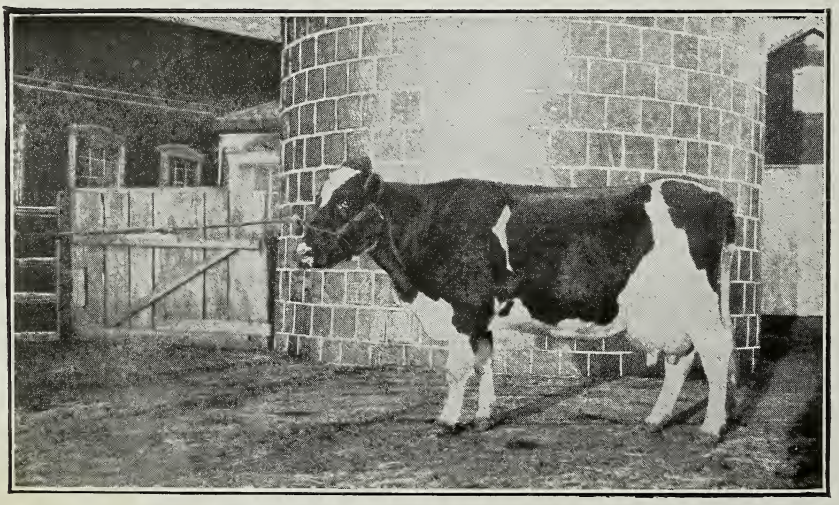
At the same rate the increase yield of 97,500 pounds resulting from the use of manure should have brought about an addition of 19,500 pounds of organic matter in the soil. The manure in-

creased the organic matter by 25,500 pounds. The difference, or 6000 pounds, represents the amount of organic matter which can be credited directly to the organic matter in the manure. This 6000 increase resulted from the application of 190 tons of manure or an increase of practically 30 pounds of organic matter for every ton of manure applied.

It must be remembered that we are not arguing as to the relative merits of manure and fertilizers as crop producers. Neither are we referring to the relative economy in the use of these two materials. We are simply pointing out that fertilizer, which contains no organic matter, is a valuable indirect source of organic matter and that manure, also, is probably a more valuable indirect source than a direct source of organic matter. Both of them cause an increase in the content of organic matter in soils because of the roots and stubble left behind in the increased crop produced by their use.

It seems desirable to point out that 190 tons of average manure will contain 1900 pounds of nitrogen, 950 pounds of phosphoric acid and 1900 pounds of potash which represents the number of pounds of these elements applied to plot 25. The fertilizer applied to plot 26 contained 675 pounds each of nitrogen and phosphoric acid and 800 pounds of potash. It would seem, therefore, that there was good reason why the plot produced better yields than the fertilized plot.

The conclusion is that if the content of organic matter in soils is to be increased to any considerable extent it will be possible largely as a result of growing larger crops, with the resulting large root systems and heavy stubble and sod. If we grow big crops in suitable rotations, whether we make use of fertilizer or manure, the organic matter will take care of itself.



TILE DRAIN OUTLET.

THE outlet of the main to a tile drainage system should be well protected to prevent its destruction by frost, flood and the tramping of live-stock. Usually it is best to replace the lower 8 to 12 feet with glazed sewer pipe, or with a piece of cast-iron pipe of proper size. This should be done when the work of laying the tile begins. To prevent the washing or tramping of earth about the outlet, and to give strength, a wall of masonry or concrete should be built around it using a 1-2-4 mixture.

Means should also be provided to prevent vermin, such as rats and rabbits from entering the mouth of the drain. To accomplish this a screen of woven wire or a grate of iron bars mounted in a strong wooden frame should be firmly set against the outlet. It will be well, in building the cement work, to set in bolts to hold the frame in place.

A trap of galvanized iron will prove effective in the exclusion of vermin, but the factor of aeration of the soil by means of the tile will be interfered with. A better device is that of a screen of ¼-inch iron rods suspended by a hinge or chain links. The hinged trap or screen is especially desirable when surface water enters the tile above my means of silt basins or otherwise.

FORAGE CROPS FOR SWINE.

Because of the high price of feed this year it is of great importance that the feeder of swine have suitable forage crops for summer pasture. In recent experiments it has been found that forage crops affects a saving of 30.7 per cent to produce 1 pound of gain, that is, it required only 3.54 pounds of grain to produce 1 pound of gain, as compared with 5.11 pounds of grain on the dry lot system of feeding.

Alfalfa is the best forage crop with clover a close second. Alfalfa will carry 12 to 20 head for 3 to 5 months according to the time of planting and the growth. Red clover will pasture 8 to 10 shoats for a period of 3 to 5 months.

As a forage crop that can be planted with another crop, cow peas is perhaps the best. The peas should be sown the last cultivation of the corn using 1¼ pecks per acre. This will furnish pasture for a period of approximately 120 days depending on the time of frost. The corn should be hogged down and this combination is satisfactory because the protein content of the peas is high giving a fairly well balanced ration.

WEANING A COLT.

COLTS should be taught to eat solid food before they are entirely weaned, according to Prof. Coffey of Ohio State University, so that the change from the mothers milk to the grain and hay ration will not be so abrupt. The colt will begin to eat at 3 or 4 weeks of age. It should be fed bruised oats and bran sweetened with molasses and wet with cow's milk. A light double handful should be fed daily for the first month and for the remainder of the time before weaning this amount should be doubled. Alfalfa or clover hay should be before the colt so that it may eat it at any time.. If on pasture a crib should be made.

The colt should be weaned at 5 or 6 months. The best method is to halter-break and tie it along side of its mother. The mother's udder should be milked by hand.

HARRY W. CLARK, '18.

THE STOMACH WORM.

THE stomach worm of the sheep is found in the fourth stomach of the animal. The worm in the larva is taken into the stomach in the feed eaten by the sheep.

The larva mature in the stomach, producing eggs which pass out with the faeces. The ideal hatching season for them is warm-day-dry-night periods of June, July, August and September. The eggs hatch in about two days and the resulting larva soon crawl around and feed upon the grass blades. The sheep will nip up these worms upon the blades of grass, and they then pass into the stomach where they do their evil work.

Infected sheep become dull, lose their appetite and get weak. Fever and diarrhea often result. Hence it behooves the owner to make the greatest possible effort toward prevention. Sheep will not become infected so quickly by grazing on long grass as they will not graze the pasture so closely. Sheep should never be permitted to rest along hedges or fences as the land will be infested worse by them in this manner.

Many remedies have been advocated for the stomach worm but about the only thing to do is to practice skilful feeding and sanitary measures.

CARE OF THE EWES AFTER WEANING.

THE owner should watch the ewes often just after weaning, as they will continue with their milk flow and many caked udders will result. The simplest and quickest remedy is to catch and milk the ewe. However, to make more certain of your operation, administer inwardly 6 ounces of Epsom Salts, apply hot water to the udder, wiping and rubbing well with a flannel rag and then apply carbolized oils.

To effect a drying up of the ewes, turn them on scanty pasture for a few days and after all danger of caked udders has passed turn them on better pasture. This will bring the ewe into good breeding condition again and they will not be nearly so susceptible to disease.

Ewes that have been flushed or, in

other words, brought from a thin condition to a good strong condition will breed within a short time. The best and most inexpensive feed for flushing ewes is rape.

E. L SHUCK, '18.

DYNAMITING STUMPS.

STUMPS in a cultivated field are a nuisance in every way. Not only is much time and trouble wasted in working around a stump but it also takes up considerable ground which might be growing a crop. The amount of ground lost will be determined by the kind of a tree that grew there as some kind of roots spread more than others.

Blowing out stumps is a very simple operation. An augur, preferably a 2-inch, is used to bore in under the center of the stump. The dynamite may be secured in different sized sticks but those containing one pound are most commonly used. After the hole is bored cut a piece of dynamite large enough to blow the stump. Experience is the only guide here to tell how much to use, as it will vary with the size and structure of the stumps.

Cut the piece of dynamite into halves, and push one half of it in the hole, tamping it thoroughly until pulverized with a round stick. An old broom is handy and useful. Cut a piece of fuse about 12 to 18 inches long or longer if the stump is large enough to require it. Stick a dynamite cap over one end of the fuse, and run this into the last stick of dynamite. Then push the other half in tightly against that pulverized, but do not pulverize the last part.

Then thoroughly pack the dirt in the hole leaving one end of the fuse outside. Now the fuse may be lighted and it will burn back thru the dirt. As soon as the fuse is lighted one should get at least 50 yards away, for when the charge is fired dirt and pieces of wood are sometimes thrown considerable distance.

One will be surprised at the benefits from this operation. Every one knows how nice it is to farm a field that is clear of everything. Sometimes a few underground roots are left but most all machinery will pass over these and they soon rot in the ground.

HOME MADE ICE CREAM.

SOME people like home-made ice cream better than that commercially manufactured. Home-made ice cream is easily made and is inexpensive. An ice cream freezer may be bought in different sizes at small cost. Ice would be hard for most farmers to get but it can easily be brought out by friends in town and a delicious refreshing product could be made after a hard day's work.

A good formula to use for 1 gallon of frozen cream is ½ cup of gelatin dissolved in 2 pints of hot milk. Have 2 eggs and 1½ cups of sugar beaten together, and then add this to hot milk and gelatin. Pour this into freezer can, and fill up until it is ⅔ full with a mixture of milk and cream or all cream. The more cream used the richer, and the better body the frozen cream will have. If all cream is used the gelatin can be omitted. Flavoring extract may be added to suit the taste.

The ice should be broken up fine, and one part of salt added to 8 parts of ice, and thoroughly mixed. More salt may be used if quick freezing is desired. The ice and the salt is placed in the freezer around the can and the turning process begun. It should not be turned too fast as it will give too much swell in the early part of the freezing and this will fall down leaving a poor

soggy body. It should not be turned too slow or a nice velvety body of cream will not be secured. The freezing process will ordinarily last 10 to 15 minutes after which the dash should be immediately removed and the cream packed until it gets solid.

Another simple method of making ice cream can be used where the richness of the cream is known. Where cream is sold one will know approximately the percentage of fat. Few farmers have a Babcock testing outfit but the fat could easily be determined if one was in possession. In this case for 1 gallon of 20 per cent cream add 1.6 pounds of sugar and .8 of an ounce of vanilla flavoring extract. Eight-tenths of an ounce of gelatin may be used as a stabilizer but a good body can be secured without it, and it saves heating up part of the cream to dissolve the gelatin. Where the cream is richer than 20 per cent, milk may be added to dilute it.

L. A. SUTERMEISTER, '18.

STARTING GRAPEVINES.

GRAPEVINE CUTTINGS should be made in the late fall or early spring just before the buds begin to burst by cutting last year's growth into pieces of 2 node lengths.

Select the healthy vines which show the most vigorous growth. Starting at the tip of the branch, cut into lengths containing 2 nodes. The top of each cutting should be cut mid-way between the first two nodes and the bottom 1 inch below the second joint. The cuttings should then be placed in sand in the cellar or buried in the ground at a depth of 1½ feet to prevent them from freezing during the winter. In early spring they are transplanted in rows in the garden where they may be carefully attended. They should be placed I inch apart and at an angle of about 45 degrees. The upper node from which the leaves start should be about 1 inch above the ground. During the summer they should be cultivated frequently to prevent the weeds from shading the young plants. The next spring they are ready to be planted in their permanent places.

H. D. F. PINKLEY, '19.

AGRICULTURAL INSTRUCTOR.

The duties of the department of agricultural education of the college have increased at so rapid a pace, due to the field of education made open by the Smith-Hughes Law, that the second man has been added to the department. E. F. Johnson of Indiana has accepted this position as assistant professor of agricultural education. At present Mr. Johnson is supervising the work of the teachers' training course which is given for those who expect to teach agriculture under the Smith-Hughes Law.

Mr. Johnson was born in northwestern Ohio. He spent his early school days here and in Indiana. Later he returned to Ohio to teach in the rural schools. He pursued his classical course at Indiana State University. Later he taught in the high schools of Indiana. While teaching he built up an agricultural high school which offered a three-year course in agriculture.

Becoming interested in agriculture he then took an agricultural course at Purdue where he obtained both his bachelor's and master's degrees. He at once began extension work in Indiana. Later he came to Ohio where he has been doing extension work aiding particularly in the seed corn testing campaign.

L. N. GEIGER, '18.

SUBSTITUTES FOR THE CORN CROP

GEO. F. JOHNSON, '19

IN view of the fact that a poorer quality of seed corn is being planted this spring more poor stands of corn than usual can be expected. How poor the stand can be before it is advisable to plow it up, is a problem for the individual farmer to solve. Many stands that were considered too poor to leave in past years will be left this year, but in case the stand is less than 50 per cent it is out of the question to leave it. No seed may be available for replanting or the spring may be too advanced to risk getting a corn crop and the question of a substitute for the crop arises.

In order that a crop may make a good substitute for corn several points must be considered. In the first place it should be a grain crop. The call for more food today makes it necessary that grain crops that are valuable as human food and as feed for livestock be grown to the greatest possible extent. Secondly, the crop must be adapted to the corn belt climate. A third and important point is that the substitute crop must be able to mature in the time alloted which will be from about June 10 until fall frost.

Soy beans, navy beans, and buckwheat are the three most important crops to be considered as substitutes for corn. Soy beans rank first among these. Their value as a human food is not appreciated by the American people. Soy beans have been used very extensively as human food by the people of China and Japan for many centuries. Little meat is eaten by these people; the beans form the chief source of protein in their diet. As a feed for livestock soy beans furnish a meal which is equal to cotton seed meal or linseed meal and the straw has a feeding value about equal to timothy hay.

The soy bean is adapted to the same range of climate as corn and varieties have been developed that will mature seed in less time than corn. The crop is especially valuable from the soil fertility standpoint in that it is a legume and will grow on acid soils better than red clover or alfalfa.

Soy bean seed is high-priced and limited in amount this spring so economy should be used in planting them. This means that they be planted in rows and not broadcast or sown solidly with a grain drill. So, if a farmer who has a field upon which he failed to get a stand of corn, decides to plant it to soy beans he should plant them in rows 34 to 36 inches apart and 2 to 4 inches apart in the row. Good varieties for seed production are Ito San, Ohio 9016, Ebony, Ohio 7496 and Elton. Planting at the rate of 3 pecks per acre is found to be best. Two to four cultivations should be given and if the rows are 36 inches apart the ordinary two-horse corn cultivator can be used. A yield of at least 20 bushels per acre can be expected.

Navy beans will make a profitable substitute for the corn crop providing the grower can arrange to get the proper machinery for harvesting. A good way to provide the machinery for the bean harvest is for the farmers of a given community to cooperate and plant an acreage large enough to warrant the purchasing or renting of the necessary harvesting machinery.

The culture of navy beans is very similar to that of soy beans. On the average corn soil beans will do especially well while on the rich soils they are likely to "go to vine," and it will

take longer for the beans to mature on a rich soil.

In the northern part of the state the climate is suitable for the growing of buckwheat. This crop should be considered in case of a failure to secure a stand of corn because it is valuable as human food and as feed for livestock. The crop matures in 60 to 70 days from time of sowing which ranges from June 15 to July 15. Three to 4 pecks per acre is the proper rate of sowing.

Certain forage crops might be suggested as substitutes but we should heed the cry of the nation for an increased production of food and plant grain crops which are valuable as human food and yield by-products valuable as feed for livestock. It is not a matter of patriotism alone, for farmers will find the grain crop substitutes far more profitable than forage crop substitutes.

TRACTOR TESTS.

The tractor tests at the tractor school held at Columbus under the direction of the Agricultural Engineering Department of Ohio State University, showed the importance of knowing the real rating of a tractor.

The standard prony brake was used and the belt horsepower taken and recorded. It was found that many of the tractors were overrated and that they could not develop the horsepower that they were guaranteed to develop. Many tractor experts said that to their knowledge it was the first time their tractor had ever been hitched to a prony brake. It was a revelation to them. One tractor showed a bare one-half of its rated horsepower and after three attempts failed to make its rating.

The knowledge that a tractor will do what it is guaranteed to do is of great importance to the farmer and the wise farmer will compel tractor manufacturers to guarantee a prony brake test rather than the estimated horsepower. One illustration of this was found during the tests. A tractor was guaranteed to develop 24 horsepower on kerosene. Running on gasoline it ran a perfect test. Upon switching to kerosene it fell to 19.35 horsepower. This is of importance because a farmer wants a tractor to do maximum efficiency on the cheapest fuel.

There were other interesting cases: a company sent its tractor to the school and before leaving the factory it was not overhauled. When it failed to develop its rated horsepower the expert started an examination. He found that the magneto was out of time 5 inches on the fly wheel causing the spark to pass late and he was not getting the full force of the explosion. After retiming the magneto, he came back and pulled his horsepower with ease, and was able to develop much more than the rated horsepower.

One tractor had magneto trouble and the designer was forced to go over the entire engine before it worked properly. Another tractor had ignition trouble and fell below its rated horsepower. After much trouble and repairing the engine finally made a perfect test. Other tractors had difficulty in coming into the belt and were unable to hold the belt at such a tension without slipping.

This brings forcibly to mind the fact that the purchaser of a tractor should compel the manufacturers to attach each tractor that they put out to a prony brake and prove that it will work properly. If the average farmer had had these tractors on his farm he would have been at a loss to know what to do to fix them and would be unsatisfied with his purchase. This surely would do the manufacturers more damage on future sales than the trouble of testing would warrant, not regarding the time and labor that would be wasted by the purchaser.

HARRY W. CLARK, '18.

SUMMER SILAGE.

THE summer silo is the most satisfactory way of supplying additional feed in districts subject to drought. Production with dairy cows and other farm animals must be maintained if the highest profits are to be realized. Also on high-priced land, where intensive agriculture must be followed, it is often desirable to keep more animals than can profitably be maintained entirely on pasture during the summer. Silage will admirably meet both these needs where enough animals are kept to feed off 2 inches or more of silage each day so that the surface will not decay.

In trials covering 3 years at the Wisconsin Station corn silage was compared with soilage as summer supplements to pasture for dairy cows. In the production of milk and butterfat the silage ration was as efficient as that containing no silage, and also far cheaper and more convenient. The silage was relished better than the succession of soiling crops. To provide a succession of green feed for animals by means of soiling crops it is necessary to fit and plant comparatively small areas to different crops at different times. As the cut silage will quickly heat in warm weather if placed in piles and will then be less palatable, a supply must be harvested each day or at least every 2 days. Harvesting in small quantities and in all sorts of weather is inconvenient and expensive and the work must be done in the busiest season of the year. On the other hand, when corn or the sorghums are grown for silage the large fields are fitted, planted, cultivated, and harvested with labor saving machinery at a minimum expense and feeding the silage takes but a few minutes daily.

Corn and sorghum return greater yields of nutrients than many of the crops it is necessary to include in a soiling system. Silage furnishes feed of uniform high quality thruout the season ,a goal which is difficult to obtain by soiling, for one crop is often exhausted or too mature before the next is in prime condition for feeding. The years when drought is severe and pastures unusually short are the times when soiling crops will be scant or may even fail. By means of the silo, the crop may be carried over from one year to the next, thus providing insurance against drought.

R. L. SUNDERLAND, '19.

KEROSENE FOR AUTOS.

ON account of the high price of gasoline many auto manufacturers have turned towards kerosene as a source of fuel but as yet none have been entirely successful. But in spite of this fact, some farmers have hit upon a system that is entirely satisfactory from a financial point of view. On one of the popular low-priced cars, the writer knows of a system that is giving good results and at the same time is cutting the cost of fuel in half. The system consists of a one gallon gasoline tank as a supplement to the main tank. The main tank is filled with kerosene The same carburetor supplied with the machine is used, but the fuel line has been changed and valves installed so that gasoline can be used far starting. As soon as the engine is warm, the fuel is taken from the kerosene tank. Care must be taken to switch back to gasoline before stopping or difficulty will be encountered in starting. The system has its faults as uneven running is encountred at low speeds but the cost of fuel expense has been reduced one half.

J. A. HOWENSTINE, '19.

CARE OF THE EWE.

The care of the ewe after lambing is essential from the standpoint of the ewe herself but more essential from the standpoint of the lamb. If the lambs are to get along nicely, they must have a sufficient quantity of good rich milk.

There are a few feeds which will make a superior flow of milk, among which are alfalfa, clover hay and roots. Roots are extremely succulent and are almost indispensable in feeding sheep. They can be sliced up and fed singly to the sheep or they may be mixed with oats, bran and some corn. However, one can not get along without bran in

feeding sheep as it is in an available form for direct use by the sheep and it acts as a regulator and conditioner.

For the first half week after the ewes lamb no grain should be fed unless it is noticed that the ewe has little or no flow of milk at which time one may feed grain sparingly. Corn should never be given to ewes at lambing time except in small quantities and as a mixture with other grain. A mixture of oats, bran and corn serves best, in the ration of 3-3-1 respectively.

Corn silage has proven to be a great feed for ewes after parturition. In an experiment by the Missouri Station it was found that the following ranked as best feeds for suckling ewes: first, corn silage, clover and grain; second, grain and silage; third, clover and silage. After about 10 days from lambing period, the same amount of grain may be used in the ration as a month before lambing.

E. L. SHUCK, '18.

WHITE SCOURS IN LAMBS.

White scours in lambs is troublesome and often fatal. It is produced by feeding the ewe in the improper way and by the lamb catching cold. Too much grain feed for the ewe will cause this trouble. The greatest fatality is where lambs are kept in the barn as sunshine and exercise prove to be the greatest preventive to the white scours.

The ewes should always be given good wholesome feed and their ration should not be changed too abruptly. If there is any chance of the white scours getting a start a dose of castor oil may prove quite effective.

The following is recommended for the white scours: ordinary cooking soda, ¼ ounce; sulphate of magnesia, 1 ounce; and a pinch of ginger. Mix the three well and give in a gruel of flaxseed. Give the dose in halves, and administer 2 ounces of linseed oil 4 hours after the last dose of gruel.

The University Observatory

FARMERS CLUBS IN WAYNE COUNTY

ROY E. MOSER, '18

MANY farmers in Wayne county have realized that the need of cooperation in the business of farming is quite as important as it is in other industrial lines. This is evident from the fact that at the present time there are 9 active, well organized farmers' clubs in the county and a few more that are not so prosperous due to poor leadership. In the beginning, the chief purpose for organizing such clubs was the idea of saving money through cooperative buying. This however, is not the main idea now since the farmer has come to realize that there are other valuable benefits to be derived from such an organization.

The clubs hold regular meetings, some twice and others only once a month. The meetings are held in the school house. During the winter months the teacher cooperates with the club and arranges a short literary program by the school children. These programs usually consist of recitations, readings, essays on agricultural subjects and musical numbers. In the summer time when there is no school the secretary asks some of the children to take part and they usually respond willingly. It is evident that this offers fine literary training to the youngsters which will be valuable to them in later years. One farmer said to me just recently, "I wish I had had such opportunities when I was a boy. It is surely a fine thing to be able to get up before a group of men and women and to say what you want to say."

Each organization has its own peculiar problems to face and has developed specific methods of meeting them. The literary program is followed by a business session during which any new or unfinished business from the last meeting is considered and properly attended. The purchasing board announces that they are ready to receive orders for sugar or lime or whatever it happens to be. The prices are also announced and a time limit for placing the order is fixed. This is followed by an intermission of about 10 minutes.

A special program is enacted after the intermission. This may consist of talks by the farmers in the community, followed by a general discussion, or it may consist of an address by the local veterinarian, or the superintendent of the schools, or some lawyer, banker, or a minister.

Occasionally the services of a specialist from the Experiment Station are secured. Whenever this is the case, the meeting is advertised in the local newspaper and some publicity is given the meeting and the school house is usually packed to its capacity.

Some of the benefits to be derived from an organization of this kind are social. A spirit of friendly brotherhood and cooperation is fostered. If a new man moves into the neighborhood he is asked to come to the club and later is given the opportunity to join the club. In this way he meets the neighbors and becomes acquainted with them. I recall an incident that happened several years ago. I was working for a man who lived in a community where farmers' clubs were unknown. One of the first days that I was there I asked him a question about a neighbor who lived about half a mile away and this is the answer that I received. He said, "I don't know anything about him.

He just moved on that place last spring and I have not become acquainted with him yet.'' This man had lived there for several months and my employer could not even recall his name. This is a typical example of conditions as they exist in many of our rural communities and they should be overcome. A good farmers' club would tend to remedy such a condition, of course it all depends upon the man. Some men are not inclined to be of a ''mixing'' nature and it is hard to get acquainted with them.

In the second place educational benefits are to be derived from a club. The farmers come to the club meeting with the idea that they are going to learn something and they usually do. When a dairyman has increased his milk supply by feeding his cattle in a certain way, he is asked to tell about it at the meeting. If another man has found some means of increasing his productivity, he tells about it. In this way many farmers have received new ideas and they return to their homes and put them into practice. The children and young folks receive literary benefits which have already been discussed. The educational standard of a community is raised since the boys and girls attend the high school, and some who have a higher idea of life go to college to study the principles of agriculture and home economics.

In the third place, financial benefits are derived. A good deal of money is saved the farmers of the neighboring communities in the course of a year since the farmers buy together. Feed, coal, fertilizers, etc., are bought in carload lots. When a car comes in the farmers are notified and they come and get their order saving extra handling, the cost of storage, and some middlemen's profits.

Some of the clubs hold a festival during the year. Considerable amounts of money which may be used for a variety of purposes are raised in this way. One farmers' club purchased a lot of good books, many of them on agricultural subjects. These books were put in the school library where the children and farmers can get them. Other clubs have secured speakers from a distance and besides paying them for their services the cost of transportation is always paid by the club.

These organizations have been a success and of much service to their respective communities. One progressive farmer said, ''If the farmers' clubs were to be discontinued and removed for any reason, I would move to a community where they exist. I consider such an organization indispensable.''

BLOAT IN SHEEP.

ONE should watch sheep carefully after turning them out on a new pasture of clover, alfalfa or rape, according to T. C. Stone of the department of animal husbandry of the Ohio State University.

The sheep should be given a good feed before turning them out on the pasture so they will not eat so much or so rapidly. If they eat too much they will become bloated. Bloating is caused by a stomach distention which in turn is produced by a gaseous fermentation. In this condition the stomach presses down upon the lungs, interfering with the breathing of the animal.

If the bloat has not proceeded too far, a remedy may be given them. By using a drenching bottle, administer from 1 pint to 1 quart of warm cow's milk, and if no relief comes in a short time, give another pint of warm milk. This remedy is given by Frank Kleinheinz of the University of Wisconsin and he states that warm milk will absorb the gas while cold milk will not. A mixture of 1 tablespoon of turpentine and one of either linseed oil or milk is a good remedy for bloat.

One must be careful not to hold the sheep too tight about the neck while giving the dose or choking will result. One must not give the dose too fast for, if they are prevented from swallowing, the medicine will run into the lungs causing instant death.

E. L. SHUCK, '18.

THE MAKING OF CLOVER HAY.

CLOVER that is cut when it is in full bloom or two-thirds full bloom makes a good quality of hay if it is properly cured. Cut at this time it furnishes the greatest possible weight and greatly increases the chances of securing a good clover seed crop later on. Many people lose sight of the fact that clover, in order to make a good crop of seed in the fall, should be cut early. The early cutting of clover thus furnishes the advantage of securing a good quality of hay of the greatest possible weight and the possibility of securing a good clover seed crop in the fall.

In an average year, the clover in Central Ohio should be cut from June 10 to 20, depending upon the season, weather and upon the condition of the clover stubble the previous fall. Clover that is sown in the spring and pastured close in the fall furnishes a poor crop of hay the next season which is from 4 to 8 days late in becoming fit to cut. An unusual amount of rainfall during the latter part of May and the first part of June likewise tends to lengthen the growing season of the clover and thus keeps it from coming into bloom.

If clover is to make a good quality of hay it should not only be cut at the right time but should likewise be properly cured. No definite statements regarding this curing of the hay can be given because the condition of the clover, the weather and the dampness of the ground varies from time to time. Under average conditions, the clover should be cut in the forenoon and raked and shocked the afternoon of the following day, thus leaving only one dew to bleach the leaves and stems. The shocks should not be too large, because such shocks usually dry out slowly at that time of the year. They should be small in diameter, well built and tall with a good rounding top. Shocked in this condition they should be left stand for a couple of days, depending upon the weather conditions. When they are properly cured out and when they are ready to

be taken to the barn, they should first be turned over, broken in two and left lay in this condition a couple of hours. In doing this you give the dampness a chance to dry out of the bottom of the shocks. In following this plan it is a good idea to tear the shocks apart in the forenoon, leave them lay over the noon hour, and then haul them in the afternoon, taking care so as to not tear more apart than you can easily take care of in the afternoon.

E. J. GRENER, '18.

CORN CULTIVATION.

"How deep shall I plow my corn this season?" This is a question which you should consider carefully before starting the summer cultivation of the crop. One of my neighbors tells me with absolute surety, "By plowing deep I am able to kill the weeds more easily and conserve the moisture," while another tells me with equal positiveness, "I am afraid to plow deep after the first time for fear of injuring the fine network of roots just beneath the surface."

Experimental results show that on fallow ground the deeper cultivation will conserve some of the moisture. However the case is somewhat different in the case of the corn crop. After the plant is once started the roots spread out in all directions just beneath the surface into a fine network which will serve to intercept any rising moisture. Deep cultivation and especially after the first time cannot help but do considerable damage to those fine roots. In a 9-year experiment conducted by Professor Hickman at the Ohio Agricultural Experiment Station an average gain of 4 bushels of grain and 213 pounds of stover was secured for the shallow over the deep cultivation.

There is no question but what the deeper cultivation is the more effective in the destruction of weeds. We find, however, that if we cultivate deep the first time we go over the crop and then use the "gopher" shovels with wide flaring points satisfactory results are obtained. Scrapers which fit on the cultivator in place of the shovels are also recommended.

JOHN K. GRAHAM, '19.

APPLES FOR COLD STORAGE.

THAT the scalding of apples in cold storage is due to immaturity is a fact unknown to many fruit growers. Scalding refers to the change which occurs with many apples, after a period in cold storage, in which the apple assumes a dark, baked color. The market value of such fruit is greatly lowered and most times such fruit results in a loss. Previously "scald" was largely attributed to storage house conditions but recent investigations have shown otherwise. It has been shown that fruit which still retained its light green color was scalded in storage. In the case of the red apples many growers pick them when only one side shows a red color and perhaps the other side still retains its leaf green. An apple of this type is immature and is almost sure to scald after being in storage a period of time.

Color values must be studied to determine when an apple is ripe. In a mature apple like the Rome Beauty, there is usually only a small portion of leaf green remaining on that part of the fruit not highly colored. This is found on the side shaded most by the tree foliage. The intensity of the leaf green is much less than in immature fruit and the ground color has become white or a yellow color. By cutting a fruit in two pieces the cross section of the immature fruit shows a distinct

green color while in the mature specimen the flesh of the fruit shows a yellow tint. In storage trials with Rome Beauty apples, the immature apples have shown a deep discoloration on the outside and when cross sectioned several layers of cells just below the skin had ceased to function and had become discolored. The mature apples showed no discoloration, only a deepening of the yellow in the ground color while the cross section also showed no discoloration but there was an increase in the yellow tint in the flesh, characteristic of the maturing of the variety.

C. H. SPRAGUE, 19.

REPLANTING CORN.

MUCH of the soft corn found in the cribs thruout Ohio this spring was due to corn that was cut in an immature condition last fall. This immature corn was largely due to that corn which was replanted last spring and which did not have a chance to fully mature as the earlier corn did. A great deal of this corn spoiled in the cribs, thus necessitating the picking of the entire crib of corn in order to save the sound. Replanted corn seldom makes a full growth due to the competition of the older stalks and it seldom has a chance to fully mature, usually being from 10 to 14 days later than the other corn about it. Under average conditions it does not increase the yield but it does increase the amount of stover.

Last spring we had a 20 acre field of corn that did not make a good stand, due to adverse weather conditions. We replanted about two-thirds of the field with the same variety of corn, thus keeping the strand of corn pure. Upon harvesting last fall we found that the part of the field that was replanted did not make as good a yield as that part of the field that was not replanted.

The corn of the entire field was put in the same crib. During the warm weather in February we found that the immature corn, due to the corn that was replanted last spring, was spoiling in the crib. This necessitated the picking over of 600 bushels of corn and the throwing out of about 40 bushels that was spoiled. But the corn that was not replanted was found to be in good condition.

Some people use an earlier variety for replanting so as to make it all ripen at the same time but in doing this you always pay heavily for the results by having a mixed strain of corn for seed the following year. I believe that you do not increase the yield of corn any by replanting but only cause it to ripen later and uneven in the fall. If the stand of corn is rather thin the stalks will yield better than if it were thick, and will thus make up a great deal for the thinner stand. If the stand of corn is too poor, I believe in tearing the ground up and planting the entire field over again with an earlier variety of corn. Of course this all depends on the season and existing conditions.

The above statements are only true when the yield and quality of corn are considered. If the corn is to be used for silage it would certainly pay to replant it, if necessary with an earlier variety or possibly with the same strain of corn as used before. If a larger amount of corn stover is desired for feed it may be a good plan to replant but considering the extra work and expense involved it certainly does not pay to replant corn when the yield and quality of the corn is taken into consideration.

E. J. GRENER, '18.

USE OF WEEDER.

SAVE time and labor by cultivating your corn crop with a weeder during the early stages of its growth. The success of the use of the weeder depends largely upon the preparation of the seed bed. If the seed bed has been well pulverized and freed from weeds before planting, the farmer will find the weeder to be of much value. The one great advantage of the weeder over the cultivator is that of being able to cultivate a much wider strip, and the work is done more rapidly. It is also quite as effective as the cultivator in killing young weeds and in reestablishing an earth mulch.

This implement should not be used in the early morning or on damp, cloudy days, because then the cells of the corn plant are full of water and the plants are turgid and are easily broken off. With good soil conditions the weeder can be used until the corn plants are a foot high if the work is done on sunshiny days. I have observed several fields of corn cultivated with a weeder until the plants were a foot high. These fields yielded as well as did those cultivated with the cultivator in the early stages of growth.

It is not best to use a weeder on land where stalks or rubbish have been turned under, because there is likely to be considerable damage done by dragging pieces of stalks or rubbish. Neither is the weeder recommended for wet soils because here the teeth pass among the weeds without destroying them, and gives them a good stimulus for rapid growth.

The weeder is a valuable implement in corn cultivation, if used in connection with a properly prepared seed bed, on a well-drained field where seeds are not permitted to grow to any size. This implement saves time and labor because it cultivates a wide strip at one crossing of the field. In reality it affords the proper cultivation for corn because we find that the largest yields come from shallow cultivated fields where the roots of the plant are not disturbed by the large shovels of the cultivator.

A CALF BROODER.

THE problem of caring for young calves in severe weather has been solved on the farm of E. Evans of Champaign County, O., with the result that he was able to save 5 calves that were dropped during the extreme weather of last winter. "Without that shed, I would possibly have lost one or two of those fine pure bred calves," said Mr. Evans, as he pointed to a calf for which he had recently refused an offer of $2000.

A small shed has been remodeled so that it contains 4 rooms. Three of these make sufficient room for 5 cows at the calving period; the other, containing the second-hand coal stove is used for the storing of feed, clover seed and seed corn. The building has a solid foundation and the partitions, by being extended only part way to the low roof, facilitate the heating. Mr. Evans says that he is able to keep the shed as warm as a living room by means of this stove and the use of plenty of bedding.

This problem has caused much trouble for the breeders of cattle, especially when the cows do not breed at the proper time, and the solution has been easily worked out on this farm. This stable is used for the calves in the summer as they are never allowed to run in the pastures with the matrons. All of the rooms are available except the one which contains the stove but this is used for storage so that the entire building is serving a purpose during most of the year.

GETTING READY FOR HAYING.

WHEN the haying season is once started an important work is begun which must be steady and careful until the end or there will be a big loss; hence everything pertaining to the hay crop should be put in the best condition before work begins. Time is worth more to the farmer at this time than at any other for when hay is ripe any delay in cutting means a loss.

Take a little time off before haying and get at the haying tools. The mower is the first tool to consider. If the gears are worn and do not mesh properly, tighten them up. Replace all other worn or missing parts. Damaged guards and sections cause much trouble so they also should be replaced. The knives should be ground before hand, so that they can be changed without taking time to regrind them during a busy day.

See that the tedder and loader are all in good condition. It is just as important to have these in good working order as the mower. The tedder and mower are subject to an excessive jarring which has a tendency to loosen the nuts and weaken the frame. Tighten the loose parts, and replace all broken and missing parts with new ones All the haying tools must be freely lubricated to avoid cutting gears and an increased draft. Purchase a two-gallon can of good harvester oil and keep a well-filled oil can on each of the machines all the time. Keep the working parts freely lubricated all the time.

There is still more haying apparatus that requires attention. The hay fork needs oiling and repairing, and there might be a broken strand in the rope which if not repaired now will cause trouble later on. Remember that a stitch in time saves nine. During the dry haying season the wagon wheels will begin to shrink so if the tires do not fit snugly they should be reset and painted. The rack also needs attention and probably painting. Remember that time is the most valuable at haying

time, and labor and money spent preparing for that period will be a good investment.

EARLY CULTIVATION.

BY freely cultivating young corn with a weeder from the time it comes up until it is several inches high one is assured of a clean crop all thru the season as well as a more vigorous growth. More depends on the cultivation of the corn crop just as it comes up than at any other period during its growth. When the corn sprout is growing beneath the ground it is being supplied with food from the kernel but as it reaches the surface of the ground it must get its own food. The young plants are tender and must have the best conditions under which to grow. This means that they must not be forced to contend with weeds and a hard packed soil. When the corn is at this stage a cultivator does poor work consequently weeds near the corn cannot be covered nor torn out as the corn also will be injured. If a smoothing harrow is used the teeth will pull out a lot of corn and clog up so the work will not be satisfactory.

The tool that will do the best work at this stage is the weeder. The long teeth are close together, small and flexible so that they will glide over stones and rubbish, tear out the weeds, loosen the soil, but tear out practically no corn. The teeth do not dig deep enough to hurt the corn yet the weeds are pulled out. If the corn ground is loose no pressure need be applied to the weeder, while if it is hard, enough pressure should be applied to do the best work.

Before the corn is up the ground can be harrowed with a spike harrow to good advantage. Then as soon as the corn is up enough to tell where the rows are, it should be weeded allowing the horse to walk between the rows. A few days later the corn should be weeded by going cross-ways of the field. Several other later cultivations can be made with the weeder. We have used the weeder to good advantage on corn that was so high that it would bend over considerably to allow the weeder to pass over it. After the corn has been cultivated once or twice with a cultivator it is a good plan to go over the piece cross-ways with the weeder. This tends to pull the dirt around the corn and cover the weeds. By using the cultivator and weeder often a field of corn can be kept clean and there will be no need for the hoe.

HAROLD E. WALTON, '20.

THE MINISTRY OF THE VETERINARIAN

Influence of the War on the Veterinary Profession

DONALD J. KAYS, Department of Animal Husbandry

A FEW years ago, people were heard to say that a world war could never be. It seemed reasonable to believe that nations who had drilled themselves for years in the practices of peace would never again send forth armed millions to cut the throats and take the lives of other armed millions. That was the belief back yonder in 1913 and even in the early part of 1914. It was only yesterday that war seemed an impossibility. Today it is an actuality. Without fear of contradiction, it is tomorrow's certain prospect.

The people of the United States, awakening slowly to the gravity of the situation, are now emerging from a half century of undisturbed peace fully equipped for war. Mighty changes have been wrought within the last year. Cantonments and officers' training camps have sprung into being over night. The Liberty Loan, the Thrift Stamp Campaign, the War Chest Drive, Red Cross and Army Y. M. C. A. activities are splendid testimonials of the fact that people are astir. Fate is silently planning the destiny of the kaiser and his empire.

Upon those who are bearing arms under the Stars and Stripes is placed the burden of this war, primarily. But this responsibility is being shared by those who remain at home. War imposes obligations upon everyone. It issues calls for the most efficient service and a nation's honor demands that this service be rendered.

Especially at this time is there a call to the veterinarian. The world war has thrown wide the door of opportunity to the members of this profession. The student who is serving an undergraduate apprenticeship in the Veterinary College today should gird himself well for the tasks that await him on the morrow. From the European battle fronts, since war began, have come repeated calls for the veterinarian. With our increased meat production campaigns in full swing in the United States, there will surely be need of the veterinarian at home.

Living up to precedents long since established, horses are required once more to bear much of the brunt in waging a great war. The motor driven vehicle for purposes of war, like the truck and tractor in commercial and agricultural fields, is supplementing but not displacing the horse. The allies have purchased more than a million horses to aid them on the western battle front. The pack mule and the horse have been featured time again in the pictorial war supplements of our newspapers. Motor trucks and tractors are rendering splendid service in this war but there are some things they cannot do. Mechanical traction is abolutely useless where the mud is deep. The tractor fails as a source of power in traversing territory cut up by trench and shell. No motor can negotiate the devious ways of a mountain trail. Mountain guns and supplies are entrusted to the dependable horse and the sure-footed pack mule. Right out in the field of service, therefore, it is demonstrated daily that a complete motorization of war units would be impracticable. War imposes conditions which make horses indispensable.

An old axiom tells us that "necessity is the mother of invention." The need for horses in this war stands sponsor

for the existence of The American Red Star and The French Blue Cross. These two organizations care for the horses on the battle fronts as does the American Red Cross minister to the needs of the allied soldiery. Surely, this is a field rich in opportunity for the "Vet". The veterinarian capable of contributing his "bit" in an organization like the American Red Star has opportunity for patriotic service thrust upon him.

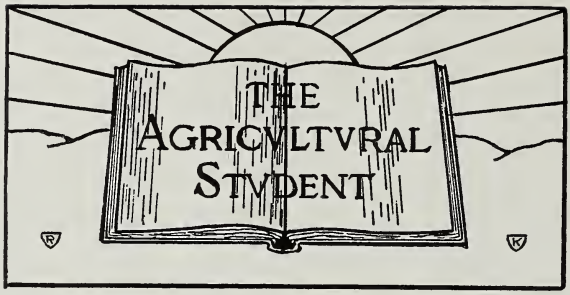
But that veterinarian in quest of a job need not go to war. Indeed, there is critical need of the veterinarian here at home. The meatless day has been inaugurated as a conservation measure. At certain designated times, says the United States government to its citizens, you shall not eat meat. Legislation may be an effective means of meat conservation but there are other ways worthy of mention. Disease and contagion are constant sources of loss in live stock production and he who outlines effective methods of control conserves our live stock resources. Here is a job that calls for capable veterinarian leadership.

The veterinarian is the jackscrew that supports, stabilizes and makes possible the live stock business. Many breeders of live stock operate their business much as the average man operates his automobile. They fare splendidly just so long as things run themselves. But if a noted bull gets down with pneumonia or if a high testing cow is stricken with milk fever then up goes the signal of distress and a hurry-up call is sent for the "Vet" who is the trouble expert in the field of live stock production.

Because of his training the veterinarian should take his place with those who are doing things constructive in live stock husbandry. Breeding, feeding and judging animals are three of the most important considerations in live stock production. If a man knows the anatomy, as a judge he will under stand better the reasons for stipulated conformation requirements. The person who knows the digestive apparatus of animals will surely have keener understanding with reference to feeds required. He who has knowledge of the generative organs reads more meaning into the processes of reproduction. If the "Vet", splendidly equipped as he is, will stand aside from his field and get the view point of the stockman, surely he will catch a vision of the splendid opportunity which is his.

In these latter days of agricultural development we hear a great deal about the extension worker and the county agent. Such men accomplish much because they enjoy the privilege of personal conference with people. There is no one who boasts closer personal contact with the live stock interests than does the veterinarian. That veterinarian who is willing to equip himself fully for service among the breeders, who devotes some of his time to a mastery of the economics in live stock production, renders more efficient service out in the field than does that individual who limits himself to the technicalities of the profession. The veterinarian has wonderful opportunity in the field of animal husbandry extension.

Somewhere in the Good Book, it is said: "The laborer is worthy of his hire." That veterinarian who is called to a constructive live stock ministry is "a laborer well worthy of his hire."



OF
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A MEDIUM FOR EXCHANGE OF IDEAS BETWEEN COLLEGE AND FARM

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EDITORIAL

ANOTHER YEAR CLOSES.

With this issue The Agricultural Student closes 24 years of history and will now take a vacation of two months before beginning again in September. The year has been unlike any other thru which the paper has passed. War and war conditions brought new problems and difficulties but we have been fortunate in many ways and the paper has been issued regularly.

Looking backward, we can see as many of our readers have seen,how the paper might have better served its purpose but we did the best that our opportunity and knowledge permitted, hoping that it might have accomplished at least part of its purpose.

Looking forward we can only hope that war and its harmful effects may not seriously interfere with the work of the paper and that it may continue with increasing success under the leadership of Carl R. Arnold and Charles H. Sprague, who have been elected as editor and business manager, respectively, for next year.

To each and every one who have contributed in any way to the success of this year's paper, we extend our sincere thanks; to all of our readers we wish the greatest joys of life. We hope that all have been repaid for reading The Agricultural Student of 1917-18 and that it may continue to receive the support and best wishes which helped and encouraged us during the entire year.

HIGH SCHOOL GRADUATES.

High school graduates, many of you have been reading this magazine and have become partially acquainted with the Ohio State University. But if you

have never visited the campus, we can not explain to you the bigness and greatness of our university.

You are leaving high school and possibly are undecided what to do next year. Do not stop with your education but, if there is any way possible, enter some college. The need of college trained men will be far greater after the war. They are now showing their worth in winning the war but the trained mind will be in great demand in the reconstruction which will follow the treaty of peace.

Possibly you have not decided what college or university you should enter. There are many in Ohio and, without detracting from the advantages of any of them in any way, we would encourage you to enter Ohio State, the biggest, best-equipped university in Ohio.

WE SAY GOODBYE.

Now comes the time when 4 years of close association with classmates and teachers must close. The time has passed rapidly; the friendships have grown stronger; the visions of life have broadened; the education has been obtained; the joys and trials of college life have been experienced and we are separating to go into the world to prove our worth, to be of service to our fellows.

We shall soon part but the old college days and college friends will never be forgotten. Many have already enlisted in the service of our country but others will go to the farm, the schoolroom or the office to perform the work which duty and opportunity offer. Let this be our creed: Wherever we may go, whatever we may do, this class of 1918 will be loyal to the United States and to Ohio State.

So now the seniors say goodbye but the spirit that has kept us in college and developed true comrades and friends will continue to hold us together, though separated into all parts of the world. When we have settled back into the paths of peace, we hope that the class of 1918 can be reunited to renew the happy days at Ohio State.

RAISE MORE POULTRY

There are few farms that do not possess some variety of poultry, often too many varieties. Are people raising poultry for profit or are they just following the custom of fathers and grandfathers? When observing the flocks, one cannot help but think that the larger number of farmers follow the latter system.

A substantial modern house is one of the necessities of this business. There are many plans available and the picture on the front cover represents one of the ideal houses. If the poultry house is not free from vermin and well built, there is work waiting for the owner.

Although some may secure pleasure in the care of poultry, the great majority are in the industry for profit. It is no longer admitted that a flock of mixed breed will lay as profitably as those pure bred strains which have been reproduced for generations on account of their egg-laying qualities. The hen that has proven her ability as a layer is the one whose eggs should be chosen for the start of a pure bred flock. With the purchase of a few such eggs, one can easily get a start in the development of a profitable strain of layers without any great outlay of money.

Poultry raising is a patriotic work and should thus receive every attention from those who are in it. Our meat supply has been severely depleted and the flock of poultry represents a quick and efficient way of replenishing it.

The farm flocks can be made to materially increase the meat supply of our country during the summer and this production will also be making use of the scraps from the table as well as other waste. As the war continues this item of our meat supply will become more important and the farms can aid in its increase by providing suitable houses and establishing a flock with egg-laying qualities.

THE COUNTY FAIR

Farmers who wait until August to get ready for their county fair usually spend one day at the "picnic" watching the horse races or the balloon ascension but the man who expects to take a real part in his fair must begin far in advance to prepare for it.

The idea and aim of a county fair should be educational and social. The social side has almost taken care of itself altho not everything has been done that would make for the betterment of conditions. The social side often ends in a family dinner where the interference of strangers is resented and the day is spent without the broadening influence of meeting new people and listening to their conversation.

Most county fairs have failed to give even a small part of the educational value to which they are adapted. No one is present to explain how superior crops have been grown; no one shows why one horse wins the blue ribbon over his competitor; no one describes the making of works of art; no one demonstrates the baking of first premium cakes or the canning of vegetables; no one explains how the champion herd of hogs has been produced and so the farmer and his family wander around over the grounds casually observing the various exhibits until they meet an old neighbor. Then old times are remembered while they forget what they had seen and agree to attend the races after they have eaten dinner together.

If the county fair is worth while it is now time for each one to plan his exhibit and get the work started, and the fair board should see that proper attendants are in charge of all exhibits.

OUR SENSE OF VALUES

Are we losing our sense of values? Conditions and values have so changed and advanced that we can scarcely realize or sense the value of many things. A bushel of wheat is usually regarded as much more valuable than a bushel of corn and yet we are paying twice as much per pound for corn meal as for wheat flour. When buying articles of clothing one does not consider how much they are worth but rather how much they cost.

Have we lost our estimation of the value of human life? Nearly 1,000,000 men, the pick of all Europe and America, have been slain in the last great offensive on the western front and yet the world goes on as if it were only natural and commonplace. Hundreds have been killed by fire and accident in the United States during the last year but few expressions of feeling have come from the people or the press.

The soldiers in France are known to be eager to get into the fight altho they are facing certain death. Is it possible that the entire world is placing a lower value on human life? Or has liberty and freedom so increased in value that men can offer their lives to obtain them for others? Our standards on the value of life have not lowered but our values of human rights and liberty have so increased that life can be given for them.

Home Economics Department

STRAWBERRY DISHES.

WHAT is more delicious than strawberries? Coming as the first of all small fruits in the spring, easy to prepare and furnishing an attractive dish for the table, strawberries deserve the particular attention of the housewife. They can be served in many different ways for breakfast, dinner or supper and their fragrance as well as their beauty adds much to the enjoyment of any meal.

Strawberry Shortcake.

Mix by sifting 4 cups of flour, ½ cup of sugar, 2 teaspoons of baking powder. Add it to 1½ cups of sweet milk, 2 eggs and 3 teaspoons of butter. Roll into layers ½ inch thick. Put one layer in a greased pan, butter the top and place the other layer on it. When baked, these will easily separate. Mash the berries and sweeten to taste. Leave a few whole berries for the top.

Strawberry Dumplings.

Into 2 cups of flour rub 3 tablespoons of butter. Add 1 teaspoon of salt, 1 egg well beaten, 2 teaspoons of baking powder and milk to moisten. Roll into a sheet about ¼ inch thick. Cut into round pieces with a biscuit cutter, place a few berries in the center of each, fold the edges over and steam about 25 minutes.

Strawberry Custard.

Line a sherbet dish with fresh strawberries and fill the center with a custard made as follows: Beat 2 eggs until smooth, not foamy—add 2 teaspoons of sugar, ¼ teaspoon of salt and then gradually stir in 2 cups of heated milk. Cook carefully in a double boiler, stirring constantly until mixture thickens and coats the spoon. Remove from the heat. Flavor with vanilla. When cool pour into the center of a dish of strawberries. Set in a cool place until ready to serve, then garnish with whipped cream and berries.

Strawbery Cake.

Cream 1 cup of sugar and ½ cup of shortening; add 2 eggs, 1 cup of strawberry sauce, ¾ teaspoon of soda, 2 cups of flour. Beat the whites of eggs and add lastly. This cake may be baked in 2 layers or loaf.

Strawberry Sponge.

Soak 1½ tablespoons of gelatine in 4 tablespoons of cold water and dissolve in 4 tablespoons of hot water. When cold add the juice of 1 lemon and 1 cup of strawberry juice with the pulp, sugar to taste. As it begins to stiffen beat with an egg beater and add the stiffly beaten whites of 3 eggs. Beat until the mixture is stiff enough to hold its shape. Serve with whipped cream.

Pineapple Gelatine.

Soak 2 tablespoons of gelatine in 3 tablespoons of cold water. Heat about ⅓ cup of hot water with ½ cup of sugar, when boiling pour over the gelatine, stirring until dissolved. Add 1 cup of pineapple juice using the cooked pineapple because the raw pineapple keeps the gelatine from thickening, and 3 tablespoons of lemon juice. Set in a cool place until it begins to thicken, then stir in a cup of sliced berries. Pour into a cold, wet mold and place on the ice until ready to serve. Garnish with whipped cream and berries.

RUTH CHRISTEN, '19.

MEAT EXTENDERS.

IN the conservation of meat, meat extenders should play a large part. By meat extenders we mean a food material, usually starchy, which is added to left over meats or to a small amount of uncooked meat. The resulting dish should justify the expense, time and energy spent in preparing it.

Some of the foods commonly used as extenders are: potatoes, carrots, turnips, celery and tomatoes. Then cereals such as rice and macaroni may be used. Left over meats may be prepared with white sauce and served with toast. Gelatin and stock may be used to make jellied veal or jellied chicken.

Flavors can be added and improved by using such things as sage, onions, parsley, mustard, pepper, tomatoes and lemon. It is not a certain amount of meat that we demand as much as it is a certain flavor which we can obtain from meat alone, and if this flavor can be extended by the use of these various vegetables and cereals with what meat we have, a great deal will be accomplished towards conserving the meat supply.

Some suggested recipes are:

Casserole of Rice and Meat.

Line a greased mold with cooked rice, fill center with chopped meat, seasoned with salt, pepper, cayenne, celery salt, onion juice, and moisten with stock of gravy. Cover meat with rice and then cover dish and steam or bake 30 to 45 minutes. Serve on a platter surrounded with tomato sauce.

Escalloped Ham and Potatoes.

Pare potatoes and cut in slices or small cubes, cut ham into small pieces. In a greased baking dish place a layer of the ham, then another layer of potatoes, continuing until the dish is filled. Add milk until it comes almost to the top of the dish. Bake in a slow oven for about 1½ hours.

Ham Souffle.

A white sauce seasoned well is used. When cold add yolks of 2 eggs beaten lightly and minced ham. Beat the whites stiff and fold in. Pour into a buttered mold or baking dish and bake 40 minutes in a moderate oven.

Escalloped Meat.

Into a baking dish put alternate layers of cooked rice and chopped or ground meat. Pour tomato sauce or gravy over each layer. Cover with crumbs mixed with fat and bake until dish is heated thru and crumbs brown.

BERTHA DUNN, '19.

PRESERVING EGGS.

NOW is the time to consider the preservation of eggs, April, May and June being the months when the supply is most abundant. Preserve only freshly laid eggs as others might be contaminated and would spoil. The egg is covered with a thin filmy skin when laid and this keeps dirt from getting into the egg through the pores in the shell. This skin gives the egg a dull appearance but is very easily broken and rubbed off. If an egg has this skin on it, it is not advisable to wash it before preserving it.

The water glass method is the best method of preservation. A 10 per cent solution should be used, that is one cup of water glass to 10 cups of water. The water should be freshly boiled. A large earthen vessel is best to use and should be well scalded, then pack the eggs in layers. After packing them pour the solution over an cover the jar with a lid or plate. The solution closes the pores in the shell; this keeps the egg from spoiling. Eggs may be kept this way for months.

Cracked or broken eggs may be dried by spreading them on plates in thin layers. Dried eggs will take up water and some air. They make good thickening agents.

MARY R. WERNER, '19.

HOW TO SAVE SOAP.

1. Save and boil up scraps. Soft soap may be made from scraps, may be used for dishwashing and cleaning purposes. It is a good way to economize, and should be done in every household to save the present supply of soap.

2. Use soap shakers and soap dishes with perforated tops. Using up little scraps in a 10 cent shaker is well worth the housewife's attention. Soap dishes with perforated tops allow the soap to dry off, shortly after use and make the cake last longer.

3. Save left-over fats for home-made soap. This applies especially to the farm housewife who throws out the fryings to the pigs and does not realize that she could economize by saving these left-overs for home-made soap.

4. Soften the water with chemicals before using soap. In this way of course you do not use nearly as much soap and better suds are obtained at the same time. Borax, ammonia, or commercial washing powder may be used for this purpose.

5. Dry out soap before using. This may be done by buying it in large quantities, unwrapping and cutting the cakes in two and allowing the soap to become hard and dry before using. It will last longer this way, and it is much cheaper to buy it in large quantities.

6. Scrape and soak dishes before washing. A great deal of soap that is wasted, is wasted because of careless dishwashing. If the dishes are scraped and soaked in soapless water before they are washed in soapy water the housewife can be both patriotic and economical.

7. Use paraffine to loosen dirt. This is a successful soap-saver and is especially good for dish towels and soiled clothes. A square of paraffine boiled with a dozen dish towels will prove that paraffine does loosen the dirt. Kerosene is also good.

8. Soak clothes the night before. This is another way to loosen dirt and should be done not only to save soap but to save work.

9. Rub soap only on soiled parts. A lot of soap and energy is also wasted by not applying soap where it is needed. Use plenty of water to insure good results.

10. Use soap substitutes whenever possible. When our present soap supply is gone we will be forced to use either soap bark or chemical soap substitutes. A thoroly satisfactory substitute has not been found, but several good ones are on the market. The housewife should get in the habit of using them now because if the present war lasts much longer and all the fats are used for explosives, she will be forced to use them because soap will not be on the market.

BERTHA HOLTKAMP, '18.

WHAT THE SENIORS WILL DO

Alvin C. Barth left school early in the spring and is now farming on the home farm near Litchfield, Ohio.

Thomas E. Berry finished school in February and is now teaching under the Smith-Hughes law at Hillsboro, O.

Ralph L. Bazler left school early in the spring and is now farming at home.

H. Gayman Chambers will operate the home farm of 150 acres near Circleville, Ohio.

Arthur S. Clark is assistant county agent to Mr. Thomas in Marion County.

Cloyce D. Copley has enlisted in the radio service of the Navy and is located at Newport, Rhode Island.

Gordon Dixon will return to the home farm in Canada and may enlist in the Royal Flying Corps.

Brant Early has enlisted in the Army.

Arthur T. Edinger has enlisted in the Quartermaster's Reserve Corps.

Eugene Fox returned to the home farm near Cincinnati early in the spring.

Lester N. Geiger will either go into extension work or take up teaching under the Smith-Hughes law.

Ralph M. Neher will operate a 300 acre farm near Tippecanoe City, Ohio.

Marion C. Overturf is at the Fourth Officers' Training Camp.

Ralph Richardson has enlisted in the Quartermasters' Reserve Corps.

John M. Sawyer is at the Fourth Officers' Training Camp.

Evert L. Shuck has enlisted in the radio branch of the Navy and is stationed at Newport, Rhode Island.

Lowell A. Sutermeister will manage the home farm near Kenton, Ohio.

Richard C. Fisher will either go into extension work or continue his studies in some other university for a master's degree.

J .T. Wilcox will probably do grain standardization work in Chicago.

Emmett W. Haas will farm at Lower Salem, Ohio.

Ernest S. Haber has enlisted in the Army.

Wallace L. Hammond is assistant county agent in Trumbull County.

Francis N. Holcombe will enlist in the Navy.

Delmar C. Jobe will farm near Cedarville, Ohio.

Millard L. Jordan will farm near Pleasant City during the summer but expects to teach under the Smith-Hughes law next year.

Harry L. Kern is now located at Camp Sherman.

George H. Krill will continue his work in the department of agricultural chemistry for a master's degree.

Chauncey P. Lang has enlisted in the Quartermasters' Reserve Corps.

William Montgomery finished school in February and is now teaching vocational agriculture in the high school at Worthington, Ohio.

Roy E. Moser will farm the home place near Orrville, Ohio.

Roy G. Gilmore is farming the home farm near Findlay, Ohio.

H. E. Jacobs will accompany Robert F. Griggs on his trip to Alaska under the auspices of the National Geographic Society.

Marion V. Bailey will probably enlist in some branch of the Army.

Harry W. Clarke will return to the home farm near Huntsburg, Ohio.

Paul C. Warner finished school in February and is now farming near Greenville, Ohio.

Andrew W. Johnson will return to the home farm near Wooster, Ohio.

Volney G. Applegate will return to

the home farm near Conover, Ohio, to await his call from the Quartermaster's Reserve Corps.

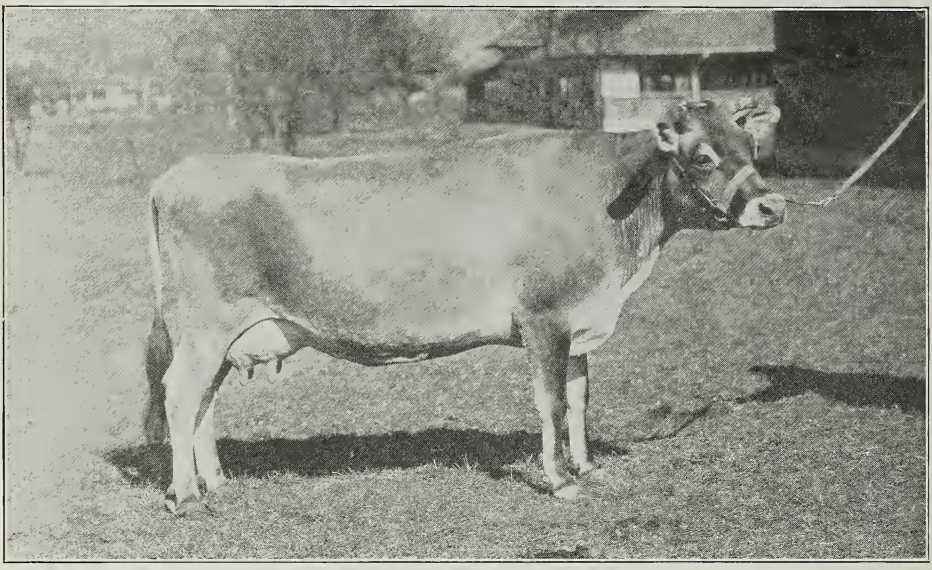
John P. Courtright has made no decision as to what work he may do.

William C. Skelley will probably go into professional baseball as he has been captain of the team this year.

Ralph H. Sturgeon will possibly return to the home farm near Glenford, Ohio.

Walter K. Kennedy is another one of the home farmers and his address will be Dover, Ohio.

The future occupation of the 44 seniors in the college of agriculture is possibly more uncertain than that of any other class that has graduated for many years. Nearly every one of them come in the selective draft and only a few of them have received deferred classification. It seems that an agricultural college graduate should be of more use on the farm than anywhere but the record shows that many of them have already enlisted and many more will be drafted before the summer is over. The class of 1918 will do its share whether in the front line trenches or on the farm.



"Hope You'll Do," Owned by Hugh Bonnell, Youngstown, Ohio

BLUEGRASS PASTURE.

BLUEGRASS pasture has proven a labor-saving and a money-making proposition on the farm of Byron Hawley of Champaign county, Ohio. He has 204 acres which were formerly covered with trees and which he has developed into one of the finest bluegrass pastures in Ohio.

When the native forest was cut about 25 years ago, all of the brush and waste lumber were removed and the land was disced twice. The seed was then sown and the land cultivated with the spring tooth. The grass was allowed to stand for two years without any grazing so that it would "go to seed." "Since that time," says Mr. Hawley, "I have had the fine pasture that you see." This pasture is the keynote of the success which he has had in the development of a baby beef plant.

Forty or more calves are raised each

year: the calves and matrons are turned out in the pasture about April 15 and remain there until November 15 when the calves are sold. Pure bred Shorthorn cows are crossed with a pure bred Angus bull and the resulting black or blue roan calves develop into fine baby beeves which usually top the market. Some of the cows are bred every year to a pure bred Shorthorn bull in order to maintain the herd. As the cows pass the age of productivity they are sold to the butcher so that little additional capital is required.

Nearly all of the 40 calves which he has now were born in the month of March. These will run with their dams all summer and will also be fed grain, consisting of ground oats, corn and barley. Mr. Hawley says that he expects to have them weighing 650 pounds each by the middle of November. Already he has been offered 14 cents per pound for them, which would mean $91 per head or a total of $3640.

While this may not be as profitable as the production of grain, the greatest point in favor of this method of management is in the saving of labor. With this plan the most of the work comes in the winter when the matrons require care, and in March when the calves

are born. But when the work begins in the fields the calves and their dams are out in the pasture caring for themselves. Water is plentiful in the pasture and the only work required is the feeding of the calves and the salting of the cows. The fact that Mr. Hawley has been following this plan for 25 years is proof that it is satisfactory and profitable.

FILLING TILE DITCHES.

THAT we might save time and labor we fill our tile drain ditches with a plow and team. When the tile are first laid we chip off the bank of the ditch on each side and let the dirt fall on the tile. Only a sufficient amount is thus chipped off to hold the tile in place. We fill the branch ditches by hand for a few feet from the main ditch so that we can get across the branches with the team without the horses falling into the ditch. Such mishaps would displace the tile, more often break them, and there is great possiblity of severely injuring a horse or a man.

We then use the horses and a plow to finish the filling as it is much easier and quicker. We use an extra long evener with a horse hitched to each end of it. When plenty of help was available two boys would lead the horses, one leading each horse. When help was not so plentiful one person would lead both horses. This is done by walking between them to one side of the ditch, leading one horse by the bit and the other with a jockey-stick so as to keep him the desired distance from the ditch. The first way is more satisfactory and is much easier done.

We fill the main ditch first and then the branch ditches. This is done by making two or three rounds up and down the ditch, plowing in from both sides.

The most of our tiling has been done in fields which were put to corn the same spring as the tiling was done. Therefore we were not particular in getting the same dirt back into the ditch that came out of it.

BENEFITS OF DRAINAGE.

BY tiling we have been able to improve the texture of our soil, to increase crop yields, and to increase the valuation of the farm. The present homestead of 154 acres has been purchased in three parts. The first part of 32 acres, when purchased, had no tile larger than 3 inches in diameter. The other two parts each had a few rods of tile drains varying in size from 4 to 6 inches in diameter.

We aimed to put in a carload of tile each spring. They were laid in the field which was to be put to corn the following spring. The tile were pur-

chased directly from the tile factory. They were shipped to and hauled from the station (about 2 miles from the farm) in the late fall or winter. As soon as the weather would permit, the ditching was begun so that the ditches could be filled with the plow before the spring plowing was done. This we thot a wise plan because we could save much time and labor in filling the ditches and the land along the drains would not remain bare of a crop the following summer.

Every drain could be traced at all times during the growth of the crop and the following crops. After a hard rain the dry streaks in the soil would first appear over these drains, showing that the soil was better aerated, and that it had a better physical condition than did the surrounding soil. As a result of this we are able to cultivate the corn crop sooner after a rain than some of our neighbors that have scarcely no tile. Also we are often able to harvest our crops much easier, especially in wet seasons.

The crops make a more rapid growth, mature better, and yield greater because the wet sour soil has been aerated and sweetened and more plant food has been put in an available form for the crop.

We have figured that the increase in crop yield of the first two crops from a thoroughly tiled field will pay for the tile and the labor required to put them in the soil and that the increase in yield of all the crops thereafter is net gain.

We have used no tile less than 4 inches in diameter. In fact we have taken up all the old drains that were less than 4 inches in diameter and replaced them with larger drains. We

now have the entire farm nearly completely tiled as we have found that it is one of the best means of increasing the value of the farm as well as being one of the best ways of increasing its fertility.

L. N. GEIGER, '18.

FEW FERTILIZERS PAY.

Such materials as acid phosphate, steamed bonemeal and basic slag are the only commercial fertilizers that farmers are justified in buying at present prices. In this way the Ohio Experiment Station summarizes its tests with many different fertilizers used on farms in 11 counties of the state, in some places for more than 20 years.

The lesson that it draws from this work carried on for so many years is that all the older soils of Ohio are ready to respond to applications of phosphorus. Many soils will respond to both phosphorus and potassium, but at the present price of fertilizer potassium its cost is likely to outrun the value of any increase that may be obtained from it in ordinary farm crops. Clover grown in systematic rotation with cereal crops can provide sufficient nitrogen, and no further additions of this element will be needed in the form of fertilizers.

Acid phosphate used alone on the Experiment Station farm at Wooster has produced an increase in crops worth at present prices $12.60 for each 100 pounds of the fertilizer. At Strongsville 100 pounds of acid phosphate has yielded a net gain of $15.14, but when muriate of potash and nitrate of soda were added to the acid phosphate this gain was changed to a loss of $2.72.

Net gains of more than $8 from 100 pounds of acid phosphate have been obtained in Montgomery, Meigs, Washington and Mahoning counties.

URGES SORGHUM RAISING.

Sorghum culture in Ohio is suggested as a means of increasing the present supply of sweets. The crop, widely grown at about the time of the Civil War, is now cultivated only a small way in the state. It requires much the same care as corn.

Twenty-five thousand acres of sorghum were grown in Ohio in 1868, and from it were produced two million gallons of syrup. The average production was 80 gallons per acre From this date the industry declined, so that in 1915 only 1,794 acres were devoted to the crop and much of this was used for forage. The syrup production that year was 43,150 gallons.

Early Amber sorghum has been found

by the Ohio Experiment Station to be best adapted to the northern part of the state, while the Early Orange variety is useful in the central and southern counties. The yields of Amber cane averaged 12.4 tons per acre for 9 years, and Orange cane, 16.7 tons for 6 years on the Experiment Station farm at Wooster.

Good corn land is considered satisfactory for sorghum. Five to eight seeds are dropped in hills about three and a half feet apart each way. The young plants grow slowly and competition with weeds must be met at the start. After-cultivation is the same as for corn.

A few farmers in Ohio still grow sorghum for syrup. The methods of making syrup today show decided improvement over those in vogue when the industry was more general in the state. Mills have been made especially for this purpose. After the juice in the cane is pressed out in these mills, it is boiled down in pans like those used in making maple syrup.

SOAKING SEED TUBERS.

Soaking seed potatoes for one hour in a solution of 4 ounces of corrosive sublimate to 30 gallons of water will control rhizoctonia and common scab if present, according to the Ohio Experiment Station. The solution must be renewed after the third using.

If only scab is present, a solution of one pint of formaldehyde to 30 gallons of water may be used instead, and the potatoes should be soaked an hour and a half. This solution can be used indefinitely.

If the potatoes are treated long before planting, they should be spread out to dry. The same solution should be used to disinfect bags, crates and planter used in handling the seed tubers.

Rotation of crops also tends to control these diseases, as they live over in the soil. Liming may tend to increase scab, but will not cause it unless the soil or seed is already infected, while rhizoctonia thrives best in an acid soil.

FERTILIZE THE APPLES.

Spreading fertilizer in circles beneath the spread of branches of the trees has returned greater profits than applying an equal quantity over the entire squares of ground occupied by the trees in orchards of cooperators of the Ohio Experiment Station. An annual gain of 3 barrels of apples per acre has resulted as an average of 4 years by confining the fertilizer to the tree circles in the section kept under tillage with cover crops, and in the section kept in grass mulch the gain has been 6 1-5 barrels over the yield obtained where the fertilizer was spread over all the ground in the orchard.

It will pay, however, to use a larger quantity of fertilizer and spread it over the entire surface, in order to produce more grass in the open spaces with which to mulch the trees.

Fertilizer applied to the trees in grass mulch has returned a four-year average annual gain of 91½ barrels per acre above the yield obtained from unfertilized trees in the same section.

DISCOLORED POTATOES.

When selecting seed potatoes, beware of the tuber showing internal discoloration, cautions the Ohio Experiment Station, for by discarding such seed you are taking a long step in preventing wilt and blackleg that may later threaten the crop.

Fusarium wilt causes a shrunken, depressed area at the stem end of the potato, and inside it forms a dark crescent-shaped marking. Plants in the field turn yellow and droop and yield a poor crop when this wilt becomes established.

Blackleg also causes plants to become unthrifty and finally die. The base of the stem turns black, and leaves often fold along the midrib. Infected tubers carry the disease over winter.

Treating seed potatoes before planting and spraying the plants have not controlled these diseases. Selection of disease-free potatoes and crop rotation are the only control measures recommended.

CHEESE AS CHEAP FOOD.

Cottage cheese is one food advocated for more general use in these days of food scarcity and high prices. It provides a large quantity of nutriment at a low cost, compared with many foods on the market today.

Analyses of cottage cheese made at the Ohio Experiment Station show that a pound contains a little more protein, or growth-producing nutriment, than an equal weight of medium fat round steak. Round steak has a higher energy value. From both standpoints about 20 ounces of cottage cheese is considered equal to a pound of round steak. Cottage cheese can be profitably made at 15 cents a pound, the Experiment Station dairymen say.

CITY AND COUNTRY WAGES.

Thirty dollars per month for a married man in the country is equivalent to $105 per month in the city, according to a survey made by the Ohio State Council of Defense. For an unmarried man a rural job at $25 per month is as good as a city job at $80 per month. The total expenditure per month of a married man is estimated at $20 in the country and $95 in the city. For the unmarried man it is estimated at $14 per month in the country and $69 in the city. So, for the married man city wages must be $75 more per month, and for the unmarried man $55 more per month than the country wages in order to allow for the same standard of living and savings. These figures are based upon a comparison of the living cost on the farm and in the average city.

This survey was undertaken to ascertain the relation between the cost of living and wages in the country as compared with the city. This is important because high wages in the city have attracted many rural people. The survey indicates that the high wages in the city have not kept pace with the high cost of living and in reality, wage-earners are better off in the country in spite of the low wages.

LEAD ARSENATE SUBSTITUTE.

Calcium arsenate is suggested by entomologists at the Ohio Experiment Station as a trial substitute for arsenate of lead in spraying fruit trees, as it has been used with little if any more injury and costs much less than the lead compound at present market prices.

Experiments have shown calcium ar-

senate to be nearly equal to lead arsenate in poisoning action, although it has caused some foliage burning on stone fruits. It may be used in combination with such spray mixtures as Bordeaux and lime-sulphur.

Prices for calcium arsenate vary from 30 to 40 cents a pound, or about 10 cents a pound less than those for lead arsenate. Moreover, less of the calcium compound is used in the spray mixture, and thus the economy in its use is twofold.

DIP THE SHEEP.

"THE sheepman that does not dip his flock is doomed to fail," says Tom C. Stone of the department of animal husbandry of the Ohio State University.

There are home-made and manufactured dips which will nicely serve the purpose of ridding the sheep of the pests. Of the home-made dips lime-and-sulphur is the cheapest, the formula being as follows: Unslacked lime, 8 pounds; flowers of sulphur, 24 pounds; water, 100 gallons. Slack the lime in a little water and add the sulphur and stir well. Transfer to 25 gallons of hot water and boil for 2 hours with frequent stirring and the addition of water at short intervals. The mixture is then allowed to settle in a barrel. Then the clear solution is dipped from the top of the barrel and enough water added to make 100 gallons of mixture. This dip does not destroy the tick to a great extent but it is a good remedy for scab.

The manufactured dips are efficient as well. Coal tar dip is a good treatment for sheep scab and will destroy the ticks and lice quite well. The sheep should be completely immersed in the liquid, as there is no danger of injuring the eyes or mouth if they are permitted to come out immediately.

THE FARM TYPEWRITER.

THE typewriter is of great value to the farmer throughout his profession. The use of it means much to the average farmer. It is not necessary to invest $60 to $100 in a machine but there are many second-handed typewriters on the market. He can get one of these for $10 to $25, and it will do

as well as a higher priced machine. I know of a second-hand machine which was bought a few years ago for five dollars. It does its work as good as a new machine and has paid for itself many times.

If you were to ask a business firm what percent of the farmers with whom they deal write their correspondence with a typewriter, they would tell you that it was low. Then if you would ask them which correspondence they gave the first consideration, they will always say those written with a typewriter.

I have had the opportunity to read some of the answers of the correspondence courses for the agricultural extension service of the Ohio State University. I have seen all kinds of writing; some that was scarcely legible and some that was written with a typewriter. These manuscripts come from successful farmers and a few business men. About one manuscript out of every 8 or 10 is typewritten; and of these only about 1 in a dozen comes from a farmer. So you can readily see that there are but few typewriters used by the farmer.

By the use of the typewriter the farmer is enabled to prepare a neater manuscript for every occasion. He is enabled to prepare a neater business letter. It is an advertisement to the farmer. The farmer who is enthusiastic enough to buy a typewriter with which to do his correspondence is regarded as an up-to-date business man. He is given prompt attention by the business people. If he is dealing in live stock, or in grain farming with the view of selling better seed, in fact any line of farming, his letters are largely his advertisements. He will also be able to get advertising done in his local paper because in the first place he is enabled to send a well prepared and legible article to the press.

L. N. GEIGER, '18.

L. L. Rummell, '15, has accepted a position as associate editor of The Ohio Farmer at Cleveland.

Frederick H. McMillen, '17, is teaching agriculture and other sciences in the high school at Columbus City, Indiana.

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A Few Entertaining Features

TANKS

The British government has gathered a War Exhibit, consisting of all varieties of trophies and implements of war, which it has agreed to exhibit at the Ohio State Fair and all net proceeds go to the Red Cross. Included in this exhibit is a British tank and possibly an enemy submarine.

SAMMIE'S EXHIBIT

Our own government has likewise built up a wonderful exhibit which requires two baggage cars for transporting. The War, Navy, Food and several other departments co-operate in making this a most comprehensive display.

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